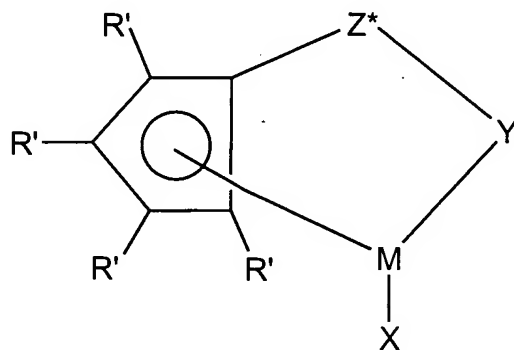


## AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) A supported catalyst system suitable for the polymerisation of olefins comprising

(a) a metallocene represented by the general formula:



wherein:

R' each occurrence is independently selected from hydrogen, hydrocarbyl, silyl, germyl, halo, cyano, and combinations thereof, said R' having up to 20 nonhydrogen atoms, and optionally, two R' groups (where R' is not hydrogen, halo or cyano) together form a divalent derivative thereof connected to adjacent positions of the cyclopentadienyl ring to form a fused ring structure;

X is a neutral  $\eta^4$  bonded diene group having up to 30 non-hydrogen atoms, which forms a  $\pi$ -complex with M;

Y is -O-, -S-, -NR\*-, -PR\*-;

M is titanium or zirconium in the + 2 formal oxidation state;

$Z^*$  is  $SiR^{*}_2$ ,  $CR^{*}_2$ ,  $SiR^{*}_2SiR^{*}_2$ ,  $CR^{*}_2CR^{*}_2$ ,  $CR^{*}=CR^{*}$ ,  $CR^{*}_2SiR^{*}_2$ , or

$GeR^{*}_2$ , wherein:

$R^*$  each occurrence is independently hydrogen, or a member selected from hydrocarbyl, silyl, halogenated alkyl, halogenated aryl, and combinations thereof, said  $R^*$  having up to 10 non-hydrogen atoms, and optionally, two  $R^*$  groups from  $Z^*$  (when  $R^*$  is not hydrogen), or an  $R^*$  group from  $Z^*$  and an  $R^*$  group from Y form a ring system,

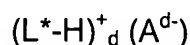
- (b) an activator comprising
  - (i) an aluminoxane or
  - (ii) a Group IIIA (CAS Version) metal or metalloid compound, and
- (c) a support material comprising an inorganic metal oxide, inorganic metal halide or polymeric material or mixtures thereof,

wherein the support material has been pretreated with a source of a transition metal atom before the support material is contacted with (a) and with (b).

2. (Original) A supported catalyst system according to claim 1 wherein the support material is silica.

3-5. (Cancelled).

6. (Previously presented) A supported catalyst system according to claim 1 wherein the activator is represented by the formula:



wherein

$L^*$  is a neutral Lewis base

$(L^*-H)^+_d$  is a Bronsted acid

$A^{d-}$  is a non-coordinating compatible anion of a Group IIIA (CAS Version) metal or metalloid having a charge of  $d^-$ , and

$d$  is an integer from 1 to 3.

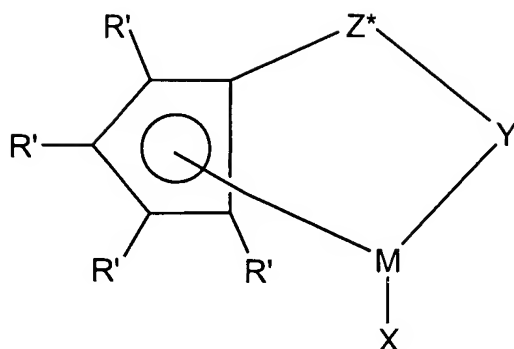
7. (Original) A supported catalyst system according to claim 6 wherein the activator comprises a cation and an anion wherein the anion has at least one substituent comprising a moiety having an active hydrogen.

8. (Previously presented) A supported catalyst system according to claim 1 wherein the activator is a fluorine containing Group IIIA metal or metalloid compound.

9. (Previously presented) A supported catalyst system according to claim 1 wherein the Group IIIA metal of the activator is boron.

10. (Currently amended) A supported catalyst system for the polymerisation of olefins comprising

(a) a metallocene represented by the general formula:



wherein:

R' each occurrence is independently selected from hydrogen, hydrocarbyl, silyl, germyl, halo, cyano, and combinations thereof, said R' having up to 20 nonhydrogen atoms, and optionally, two R' groups (where R' is not hydrogen, halo or cyano) together form a divalent derivative thereof connected to adjacent positions of the cyclopentadienyl ring to form a fused ring structure;

X is a neutral  $\eta^4$  bonded diene group having up to 30 non-hydrogen atoms, which forms a  $\pi$ -complex with M;

Y is -O-, -S-, -NR<sup>\*</sup>-, -PR<sup>\*</sup>-,

M is titanium or zirconium in the + 2 formal oxidation state;

Z<sup>\*</sup> is SiR<sup>\*</sup><sub>2</sub>, CR<sup>\*</sup><sub>2</sub>, SiR<sup>\*</sup><sub>2</sub>SiR<sup>\*</sup><sub>2</sub>, CR<sup>\*</sup><sub>2</sub>CR<sup>\*</sup><sub>2</sub>, CR<sup>\*</sup>=CR<sup>\*</sup>, CR<sup>\*</sup><sub>2</sub>SiR<sup>\*</sup><sub>2</sub>, or

GeR<sup>\*</sup><sub>2</sub>, wherein:

R<sup>\*</sup> each occurrence is independently hydrogen, or a member selected from hydrocarbyl, silyl, halogenated alkyl, halogenated aryl, and combinations thereof, said R<sup>\*</sup> having up to 10 non-hydrogen atoms, and optionally, two R<sup>\*</sup> groups from Z<sup>\*</sup> (when R<sup>\*</sup> is not hydrogen), or an R<sup>\*</sup> group from Z<sup>\*</sup> and an R<sup>\*</sup> group from Y form a ring system,

- (b) a cocatalyst comprising an organometallic compound, and
- (c) a support material comprising an inorganic metal oxide, inorganic metal halide or polymeric material or mixtures thereof,

wherein the support material has been pretreated with a source of a transition metal atom before the support material is contacted with (a) and with (b).

11. (Previously presented) A supported catalyst system according to claim 1 or 10 wherein the source of the transition metal atom is a transition metal salt.

12. (Previously presented) A supported catalyst system according to claim 11 wherein the transition metal atom is iron or copper.

13. (Original) A supported catalyst system according to claim 11 wherein the transition metal salt is ferrous sulphate, cupric sulphate or ferrous D-gluconate.

14. (Previously presented) A supported catalyst system according to claim 1 or 10 wherein the transition metal content on the support material is in the range 0.001% to 10 %.

15. (Previously presented) A process for the polymerisation of olefin monomers selected from the group consisting of (a) ethylene, (b) propylene, (c) mixtures of ethylene and propylene and (d) mixtures of (a), (b) or (c) with one or more other alpha-

olefins, comprising performing said polymerisation process under polymerisation conditions in the presence of a supported catalyst system according to claim 1 or 10.

16. (Previously presented) A process for the polymerisation of ethylene or the copolymerisation of ethylene and alpha-olefins having from 3 to 10 carbon atoms, comprising performing said polymerisation process under polymerisation conditions in the presence of a supported catalyst system according to claim 1 or 10.

17. (Previously presented) A process according to claim 15 wherein the alpha-olefins are selected from the group consisting of 1-butene, 1-hexene, 4-methyl-1-pentene and 1-octene.

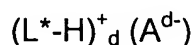
18. (Previously presented) A process according to claim 15 carried out in the gas phase.

19. (Previously presented) A process according to claim 16 wherein the alpha-olefins are selected from the group consisting of 1-butene, 1-hexene, 4-methyl-1-pentene and 1-octene.

20. (Previously presented) A process according to claim 16 carried out in the gas phase.

21. (Currently amended) A supported catalyst system suitable for the polymerisation of olefins comprising

- (a) a transition metal compound,
- (b) an activator represented by the formula:



wherein

$L^*$  is a neutral Lewis base

$(L^*-H)^+_d$  is a Bronsted acid

$A^{d-}$  is a non-coordinating compatible anion of a Group IIIA (CAS Version) metal or metalloid having a charge of  $d^-$ , and

$d$  is an integer from 1 to 3, and

- (c) a support material comprising an inorganic metal oxide, inorganic metal halide or polymeric material or mixtures thereof,

wherein the support material has been pretreated with a source of a transition metal atom before the support material is contacted with (a) and with (b).

22. (Previously presented) A supported catalyst system according to claim 21 wherein the support material is silica.

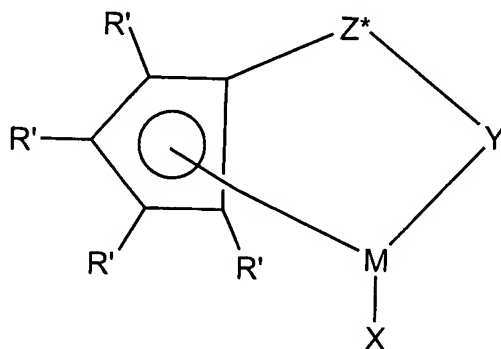
23. (Previously presented) A supported catalyst system according to claim 21 wherein the transition metal compound is a metallocene.

24. (Currently amended) A supported catalyst system according to claim 23 wherein the metallocene has the formula:



wherein Cp is a single cyclopentadienyl or substituted cyclopentadienyl group optionally covalently bonded to M through a substituent, M is a Group **[[VIB]] IVB** (CAS Version) metal bound in  $\eta^5$  bonding mode to the cyclopentadienyl or substituted cyclopentadienyl group, X each ~~occurrence~~ occurrence is hydride or a moiety selected from the group consisting of halo, alkyl, aryl, aryloxy, alkoxy, alkoxyalkyl, amidoalkyl, and siloxyalkyl having up to 20 non-hydrogen atoms and neutral Lewis base ligands having up to 20 non-hydrogen atoms or optionally one X together with Cp forms a metallocycle with M and n is dependent upon the valency of the metal.

25. (Previously presented) A supported catalyst system according to claim 23 wherein the metallocene is represented by the general formula:



wherein:



R' each occurrence is independently selected from hydrogen, hydrocarbyl, silyl, germyl, halo, cyano, and combinations thereof, said R' having up to 20 nonhydrogen atoms, and optionally, two R' groups (where R' is not hydrogen, halo or cyano) together form a divalent derivative thereof connected to adjacent positions of the cyclopentadienyl ring to form a fused ring structure;

X is a neutral  $\eta^4$  bonded diene group having up to 30 non-hydrogen atoms, which forms a  $\pi$ -complex with M;

Y is -O-, -S-, -NR<sup>\*</sup>-, -PR<sup>\*</sup>-,

M is titanium or zirconium in the + 2 formal oxidation state;

Z<sup>\*</sup> is SiR<sup>\*</sup><sub>2</sub>, CR<sup>\*</sup><sub>2</sub>, SiR<sup>\*</sup><sub>2</sub>SiR<sup>\*</sup><sub>2</sub>, CR<sup>\*</sup><sub>2</sub>CR<sup>\*</sup><sub>2</sub>, CR<sup>\*</sup>=CR<sup>\*</sup>, CR<sup>\*</sup><sub>2</sub>SiR<sup>\*</sup><sub>2</sub>, or

GeR<sup>\*</sup><sub>2</sub>, wherein:

R<sup>\*</sup> each occurrence is independently hydrogen, or a member selected from hydrocarbyl, silyl, halogenated alkyl, halogenated aryl, and combinations thereof, said R<sup>\*</sup> having up to 10 non-hydrogen atoms, and optionally, two R<sup>\*</sup> groups from Z<sup>\*</sup> (when R<sup>\*</sup> is not hydrogen), or an R<sup>\*</sup> group from Z<sup>\*</sup> and an R<sup>\*</sup> group from Y form a ring system.

26. (Previously presented) A supported catalyst system according to claim 21 wherein the activator comprises a cation and an anion wherein the anion has at least one substituent comprising a moiety having an active hydrogen.

27. (Previously presented) A supported catalyst system according to claim 21 wherein the source of the transition metal atom is a transition metal salt.

28. (Previously presented) A supported catalyst system according to claim 27 wherein the transition metal atom is iron or copper.
29. (Previously presented) A supported catalyst system according to claim 27 wherein the transition metal salt is ferrous sulphate, cupric sulphate or ferrous D-gluconate.
30. (Previously presented) A supported catalyst system according to claim 21 wherein the transition metal content on the support material is in the range 0.001 % to 10 %.
31. (Previously presented) A process for the polymerisation of olefin monomers selected from the group consisting of (a) ethylene, (b) propylene, (c) mixtures of ethylene and propylene and (d) mixtures of (a), (b) or (c) with one or more other alpha-olefins, comprising performing said polymerisation under polymerisation conditions in the presence of a supported catalyst system according to claim 21.
32. (Previously presented) A process for the polymerisation of ethylene or the copolymerisation of ethylene and alpha-olefins having from 3 to 10 carbon atoms, comprising performing said polymerisation process under polymerisation conditions in the presence of a supported catalyst system according to claim 21.

33. (Previously presented) A process according to claim 31 or 32 wherein the alpha-olefins are selected from the group consisting of 1-butene, 1-hexene, 4-methyl-1-pentene and 1-octene.

34. (Previously presented) A process according to claim 31 or 32 carried out in the gas phase.